The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WAYNE V. SORIN and DOUGLAS M. BANEY

Appeal No. 2004-2022
Application No. 09/488,149

ON BRIEF

Before KRASS, BARRETT and BLANKENSHIP, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

Decision On Appeal

This is a decision on appeal from the final rejection of claims 1-4, 11, 12, 14, and 15. Claims 5-10, 13, and 16-20 have been indicated by the examiner to be drawn to allowable subject matter and are not on appeal before us.

The invention is directed to the optical heterodyne detection of an optical signal that utilizes optical attenuation.

In particular, an input signal is attenuated, and the attenuated input signal is combined with a local oscillator signal and this combined optical signal is then detected. It is said that by attenuating the input signal before it is combined with the local oscillator signal, the signal to noise ratio of the heterodyne signal that is generated when the combined optical signal is detected is improved. It is further said that this is specifically so in the case where the intensity noise from the input signal is the dominant noise source, because the heterodyne signal and the intensity noise of the input signal scale differently with attenuation of the input signal.

Representative independent claim 1 is reproduced as follows:

1. A method for monitoring an optical signal utilizing optical heterodyne detection comprising steps of:

providing an input signal;

providing a local oscillator signal;

attenuating said input signal;

combining said attenuated input signal with said local oscillator signal to create a combined optical signal;

detecting said combined optical signal; and

generating an output signal that is indicative of an optical parameter of said input signal.

The examiner relies on the following references:

Evans et al. (Evans)	4,048,573	Sep. 13, 1977
Hasegawa et al. (Hasegawa)	4,553,264	Nov. 12, 1985
Sorin	5,365,335	Nov. 15, 1994

In addition, the examiner relies on admitted prior art (APA) at page 1, lines 14-31, of the instant specification. This portion of the specification describes Figure 1, which is a prior art depiction of a conventional optical heterodyne detection system.

Claims 1-4, 11, 12, 14, and 15 stand rejected under 35 U.S.C. § 103 as unpatentable over APA, Sorin, Hasegawa and Evans.

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in

the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teachings, suggestions or implications in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

The examiner asserts that APA and Sorin disclose the monitoring of an optical signal using a heterodyne detection and providing an input signal, a local oscillator signal, and detecting the combined signal, but these references fail to disclose an attenuator positioned before the heterodyne signal combination.

This much is apparent from a comparison of APA Figure 1 and the inventive Figure 2 of the instant application, i.e., that the difference between the prior art and the instant invention is the provision of an attenuator, by the latter, at the input and prior to combining the input signal with the local oscillator signal.

The examiner contends that the disclosure by Hasegawa of a heterodyne tuner with an attenuator positioned immediately after the input (Figure 8, element 62) and the disclosure by Evans of amplification improvements that include attenuation at the input (Figure 1, abstract), would have made it obvious, within the meaning of 35 U.S.C. § 103, to have positioned the attenuator of Sorin immediately after the input port and before the signal combination "since the noise intensity from the input signal is usually a dominant noise source" (answer-page 5). The examiner goes on to state that

> Although the placing the attenuator immediately following the input signal achieves the same functional purpose as placing it after the coupler to provide attenuation feedback, it is clear that placing it at the site of dominant noise generation would render it more advantageous and beneficial because attenuators are well known in the art and are widely used to reduce noise levels (answer-page 5).

The examiner has pointed to no teaching in the references that would indicate any advantage in placing the attenuator at the input signal and prior to the combining of the input signal with the local oscillator signal. The only advantage regarding placing the attenuator at the site of dominant noise generation is disclosed by appellants. Therefore, it appears that the examiner is relying on impermissible hindsight in reaching a conclusion of obviousness.

While Evens teaches an advantage to be had in limiting clipping in an amplifier, this would have offered no suggestion to the artisan to employ such an input-positioned attenuator at the input signal in APA or Sorin because clipping is not a concern or a desire in either of these two references. Thus, there is no suggestion to apply an attenuator at the input signal in an environment for monitoring an optical signal utilizing optical heterodyne detection.

It appears to us that the examiner needs a convincing rationale as to why the artisan would have placed an attenuator at the input signal of APA or Sorin, and the examiner has not provided it. The examiner relies on Hasegawa and Evans to supply the rationale, but it is not clear to us why the artisan would have been led, from these references, to locate an attenuator at the input signal of APA or Sorin since the art offers no advantage that would have motivated the artisan to make the modification. The examiner says that placing the attenuator at the site of dominant noise generation would render it more advantageous and beneficial because attenuators are well known in the art and are widely used to reduce noise levels, and that maximizing signal to noise ratio at the dominant noise source would have been obvious to do for any optical system (answer-pages 5-6). Appellants challenge this allegation with evidence (see appendices to the principal brief) that placing an attenuator at the input chain of optical components is detrimental when signal-to-noise ratio is important (see the top of page 8 of the principal brief, together with the appendices to that brief), and the examiner has not adequately addressed this objective evidence. In view of appellants' challenge, with attendant evidence purporting to show why the artisan would not

have employed an attenuator at the input signal in APA or Sorin, the examiner was put to his proof as to why, in view of this evidence, the artisan would have found it obvious to place an attenuator in the claimed location. In our view, the examiner has failed to overcome appellants' challenge.

Further, the examiner states that Hasegawa provides a "reason to rearrange the attenuator of Sorin so as to place it immediately after the input" (answer-page 8). But, such a rearrangement would result in the loss of the attenuator in the branch disclosed in Sorin and this would cause the Sorin system to operate in a manner inconsistent with the intention of Sorin. Therefore, the skilled artisan would not have sought to make the modification proposed by the examiner.

Since the examiner has not set forth a convincing rationale to modify APA or Sorin so as to place an attenuator at the input signal, no prima facie case of obviousness has been established and we will not sustain the rejection of claims 1-4, 11, 12, 14, and 15 under 35 U.S.C. § 103.

The examiner's decision is reversed.

REVERSED

ERROL A. KRASS)
Administrative Patent Judge)
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LEE E. BARRETT)
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) APPEALS AND
) INTERFERENCES
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